Government of South Australia
Department of Water, Land and Biodiversity Conservation

Protection of agricultural land against erosion in the Eyre Peninsula Region

Seasonal Report November 2009

Issued by:
Department of Water, Land and Biodiversity Conservation

Summary

- Good growing conditions over most of the region provided a high bulk of dry matter and resulted in good surface cover in October apart from an area around Cowell where low rainfall resulted in poor plant growth and groundcover.

- The level of protection of land in the region from wind and water erosion in October 2009 is around the long term average for the region since monitoring began.

- At the average rate of decline of surface cover from October to March experienced since monitoring began, cover levels in most of the region are still expected to be at a level regarded as adequate to protect against erosion in March 2010. Around Cowell, groundcover will need to be closely managed to maintain adequate cover for erosion protection in coming months.

Seasonal Conditions

Rainfall deciles for the period May to October 2009 show that Eyre Peninsula received average to above average rainfalls for the growing season this year (Figure 1).

Scattered rainfalls occurred across the region in March with Western and Central Eyre Peninsula receiving well above average rainfall for the month. A thunderstorm of 43 mm and a tornado occurred at Cummins on the 12th of March.

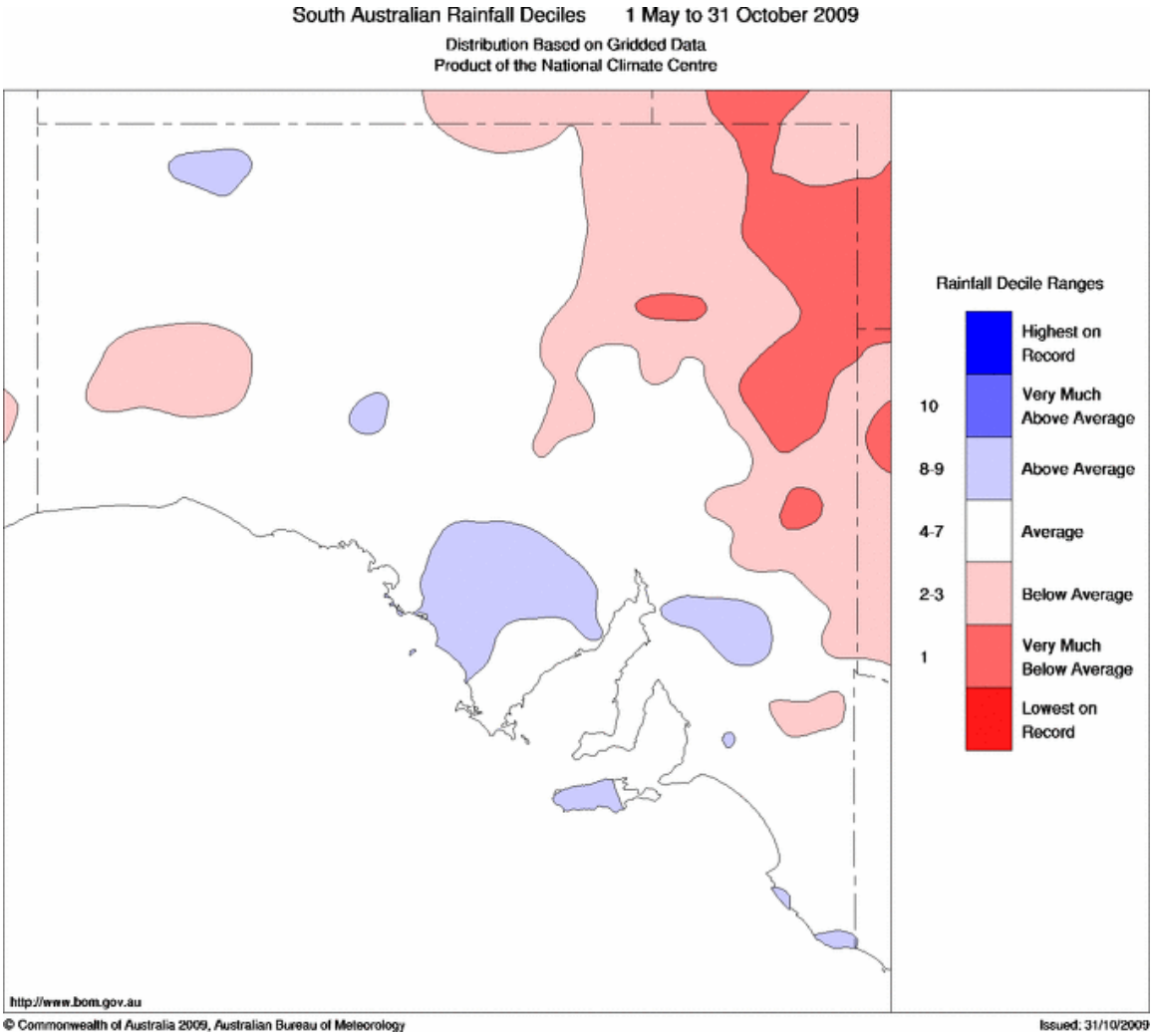
Above average rainfall was recorded during April across the region. Most locations reported falls of over 25 mm in late April except for some areas in the Eastern Eyre Peninsula.

Drier conditions and windy weather were experienced in May. Severe winds late in the month cut crops off at ground level and caused recently sown crop paddocks to drift on Western Eyre Peninsula.

Wetter conditions returned in June with average to well above average rainfalls observed. Strong winds in the fist week of June caused erosion on sandy paddocks

near Mangalo. Waterlogging was noted on Lower Eyre Peninsula around Cummins, White River and Stokes while heavy rainfall mid-June caused localised flooding and sheet erosion in the Calca district between Streaky Bay and Venus Bay on Western Eyre Peninsula.

Figure 1:



The wet weather continued into July with most locations recording falls in the decile 8 to 10 range. Minimum temperatures were warmer than average which helped to maintain strong plant growth. A thunderstorm in the Wharminda to Port Neill area yielded rainfalls of more than 70 mm. Runoff occurred and waterlogging persisted in the lower lying areas of lower Eyre Peninsula.

August was predominantly dry. A number of windy days caused erosion on the top of exposed dunes on Eastern Eyre Peninsula. The dry conditions persisted into September with hot, windy weather affecting plant growth on Upper Eyre Peninsula before wet, cold conditions returned mid-month.

Hot days late in October ended the growing season in parts of the region. Wind erosion was noted on paddocks north of Cowell.

Cumulative rainfall data for selected sites across Eyre Peninsula are shown in Appendix 1.

Soil surface cover levels

The Department of Water, Land and Biodiversity Conservation conducts a Land Condition Monitoring Program which assesses the risk of wind and water erosion on susceptible land in the cropping areas four times a year. Surface cover levels and soil disturbance are visually rated during these surveys.

The surface cover rating system used is based on a scale of 1-8 where 1 = full cover and 8 = bare ground.

Rain from storms in March on Western Eyre Peninsula led to many farmers working up land in preparation for and sowing feed crops. In the Cleve and Kimba areas, many paddocks were observed to have been cultivated for weed control. High stubble loads, snails and herbicide resistant weed seeds prompted farmers to burn stubbles on Lower Eyre Peninsula during April.

Cover levels on paddocks on western areas of the region were poor around the time most crops were sown, and containment areas for livestock feeding were used extensively.

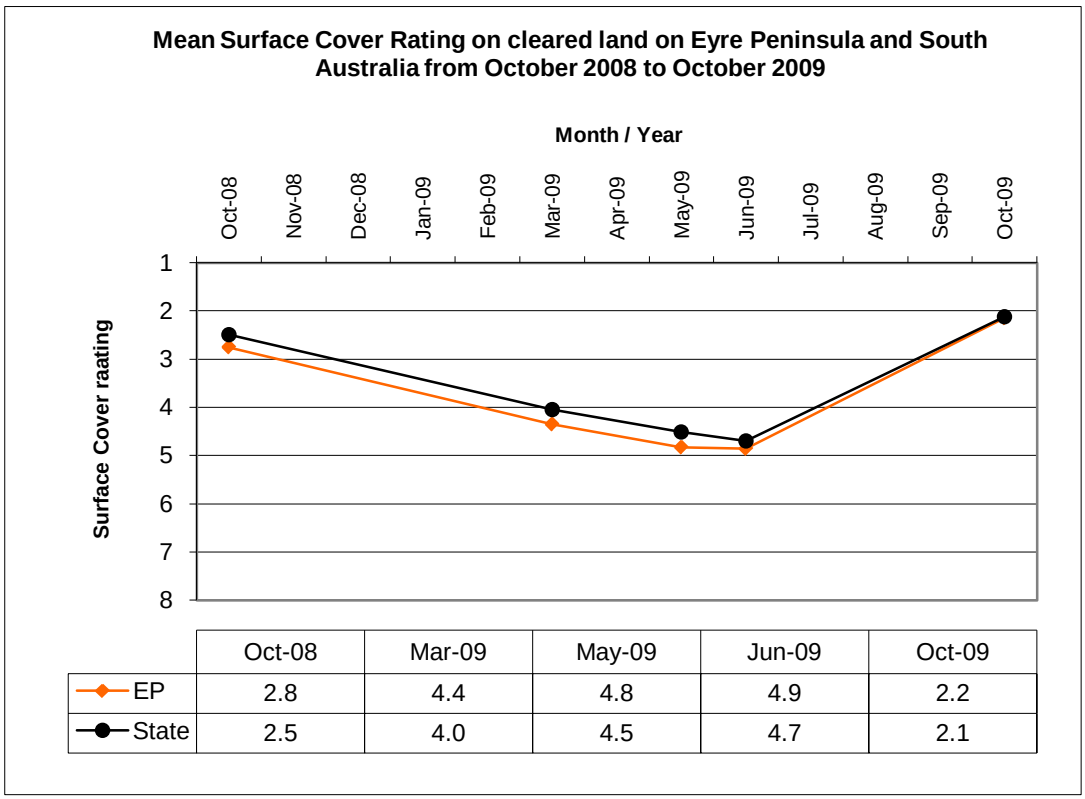
Mild conditions in June encouraged rapid plant growth except for the Cowell area where growth was poor. Through the remainder of the growing season most areas flourished, but crops and pastures in the Cowell area struggled to establish good surface cover.

Appendix 2 shows estimated pasture growth in kilograms per hectare per day for some district councils on Eyre Peninsula during the growing season. These estimates are derived using remote sensing of plant biomass combined with climate and soil data, and are available from the CSIRO's "Pastures From Space" program. The effect of the dry, warm conditions in September on plant growth is evident in graphs from some district councils, such as Cleve, Franklin Harbour, Kimba and Le Hunte.

Figure 2 shows how surface cover ratings changed over the 13 months to October 2009.

Surface cover is usually at its maximum in October. Cover levels in spring decline over summer and into autumn as plant residues break down. Grazing reduces cover levels further. The average change in cover rating between October and March is 1.4 so it is anticipated that by March 2010, surface cover levels will be around 3.4, less than the critical Cover Rating of 5, above which land is considered to be at risk of erosion. It is expected that around Cowell however, where growth was poor during the growing season, there will not be enough surface cover on some paddocks to provide protection from erosion.

Figure 2:

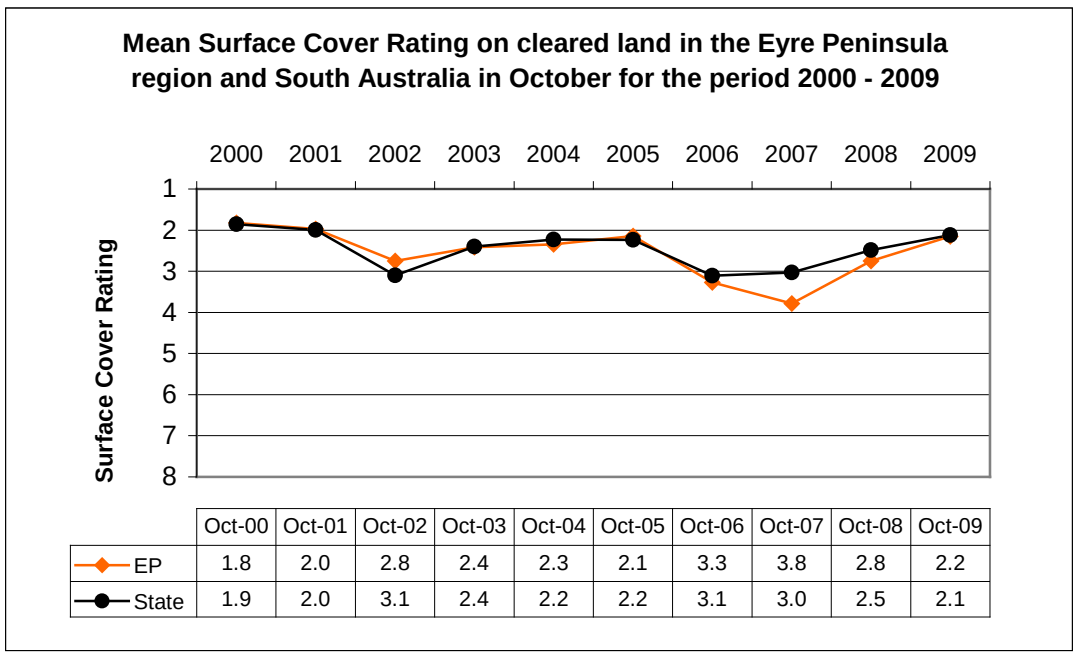


	Oct-08	Mar-09	May-09	Jun-09	Oct-09
EP	2.8	4.4	4.8	4.9	2.2
State	2.5	4.0	4.5	4.7	2.1

Note: Cover rating of 1 = full cover; 8 = bare

The trend in soil surface cover levels in October since 2000 is shown in Figure 3. Surface cover on Eyre Peninsula in October this year was better than October 2008 and around the average of 2.5 for October since monitoring began.

Figure 3:



	Oct-00	Oct-01	Oct-02	Oct-03	Oct-04	Oct-05	Oct-06	Oct-07	Oct-08	Oct-09
EP	1.8	2.0	2.8	2.4	2.3	2.1	3.3	3.8	2.8	2.2
State	1.9	2.0	3.1	2.4	2.2	2.2	3.1	3.0	2.5	2.1

Note: Cover rating of 1 = full cover; 8 = bare

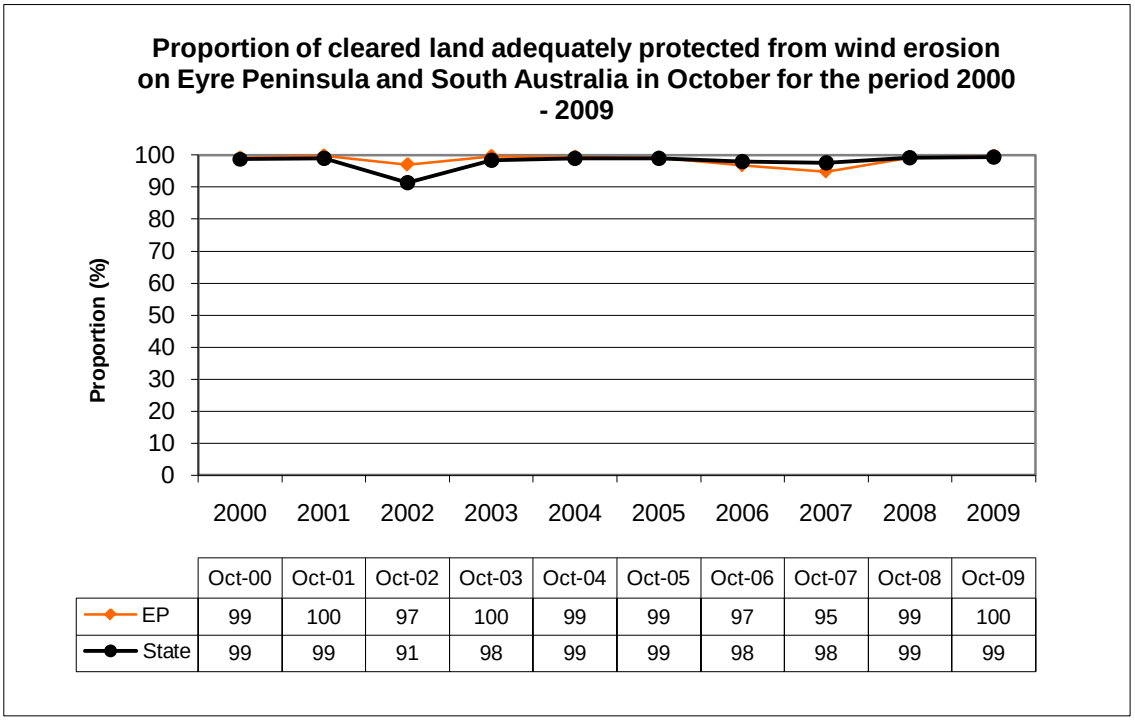
Protection of land from wind erosion

The area of cleared land inherently susceptible to wind erosion due to soil type, rainfall and topographic features (Class III_a, IV_a and V_a) is approximately 784,000 ha or 28% of cleared land in the Eyre Peninsula NRM Region. This is mainly found on the sandier soil types of Western, Central and Eastern Eyre Peninsula.

The proportion of land protected from wind erosion in October is the same compared to October 2008 and equal to the average for the 2000 – 2009 period of 99% (Figure 4).

Although the surveys found adequate cover levels and good protection of wind erosion prone land overall, there are some isolated patches (such as around Cowell) that pose an ongoing wind erosion hazard.

Figure 4:



	Oct-00	Oct-01	Oct-02	Oct-03	Oct-04	Oct-05	Oct-06	Oct-07	Oct-08	Oct-09
EP	99	100	97	100	99	99	97	95	99	100
State	99	99	91	98	99	99	98	98	99	99

At this time of the year, the main erosion risk is associated with the lack of surface cover as there is little soil disturbance due to tillage.

Protection of land from water erosion

The area of cleared land inherently susceptible to water erosion due to soil type and topography (Class III_e, IV_e and V_e), is approximately 226,000 ha or 8% of cleared land in the Eyre Peninsula NRM Region. It mainly occurs on the hilly land of Lower Eyre Peninsula.

The proportion of land protected from water erosion in October was 100%, which equals the average for the period 2000 to 2009 (Table 1).

Table 1: Proportion of cleared land (%) protected from water erosion in October on Eyre Peninsula and South Australia for the period 2000 – 2009

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
EP	100	100	99	100	100	100	100	100	100	100
State	100	100	99	100	100	100	99	100	100	100

Conclusions

Good growing conditions over most of the region provided a high bulk of dry matter and resulted in good surface cover in October apart from an area around Cowell.

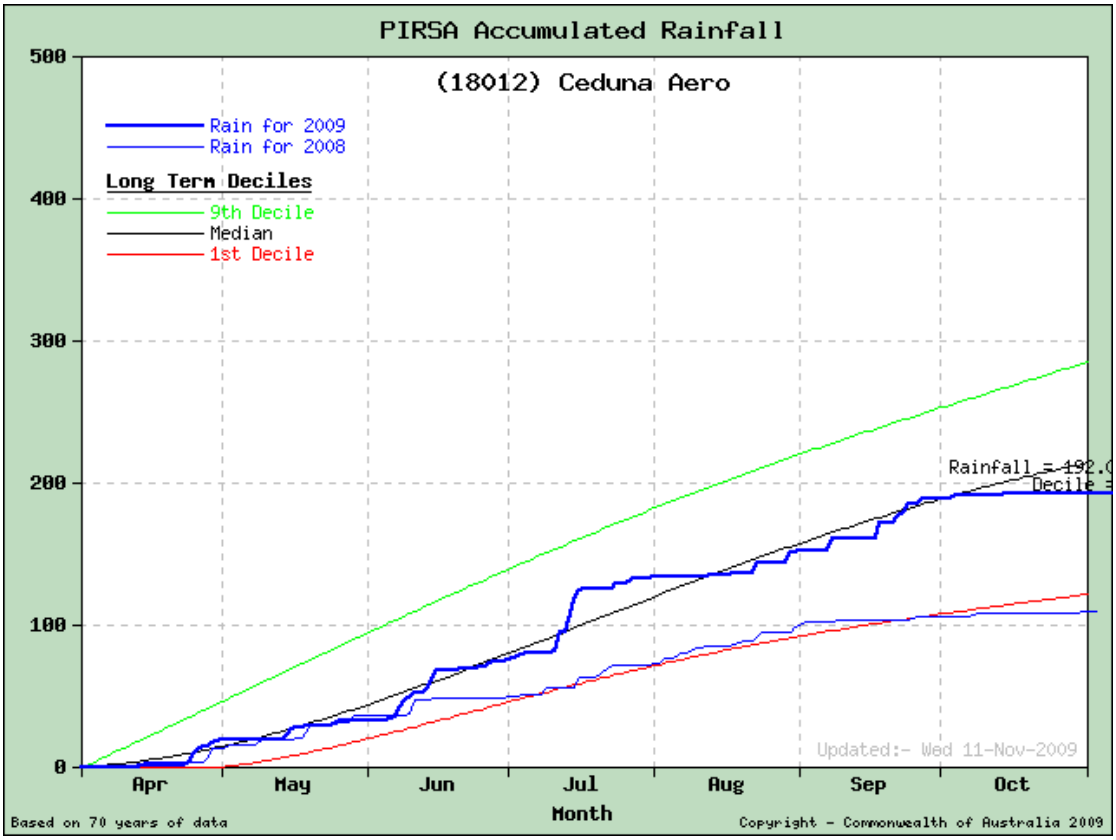
The level of protection from wind and water erosion in October 2009 is around the long term average for the region since monitoring began.

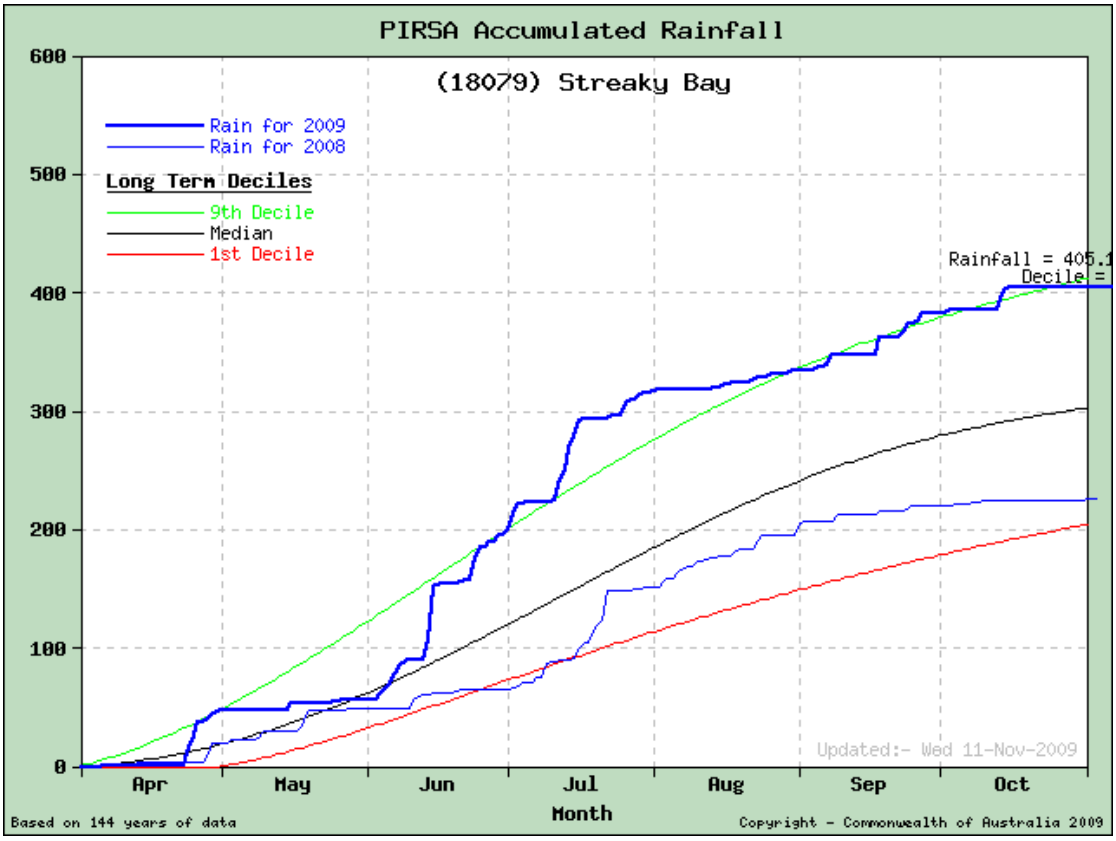
Soil surface cover levels will decline over summer as the plant residues break down naturally and are grazed. Tillage can also reduce cover levels as most tillage implements tend to break up and / or bury plant residues. At the average rate of decline experienced since monitoring began, cover levels are still expected to be at a level regarded as adequate to protect against erosion.

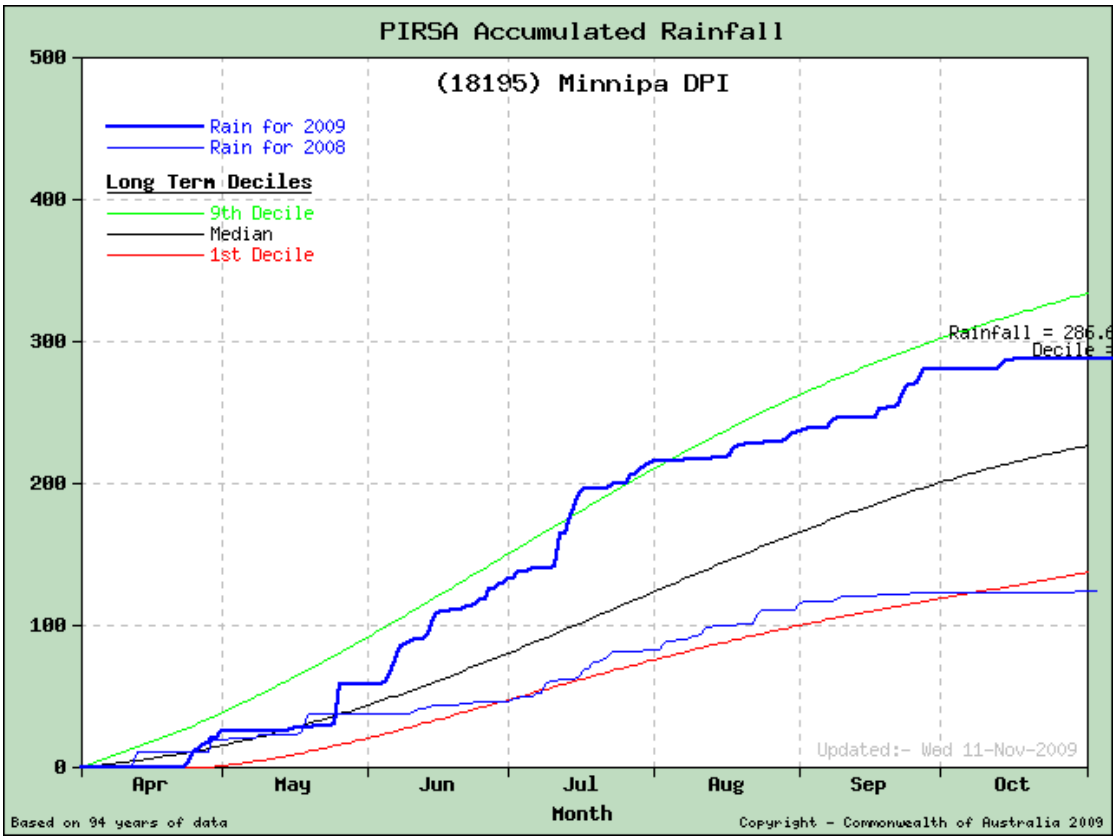
Producers' management of livestock grazing is critical in maintaining adequate levels of surface cover over summer and into autumn. Cultivating land as close as practical to or at seeding time, will leave cover on the soil surface for a longer period of time. Summer rains can stimulate plant growth leading to better cover of the soil however soil moisture retention and weed control is achieved by killing off this growth. Using herbicides rather than tillage to do this will be better for retaining surface cover. Where summer plant growth is grazed, attention will still have to be paid to maintaining adequate surface cover.

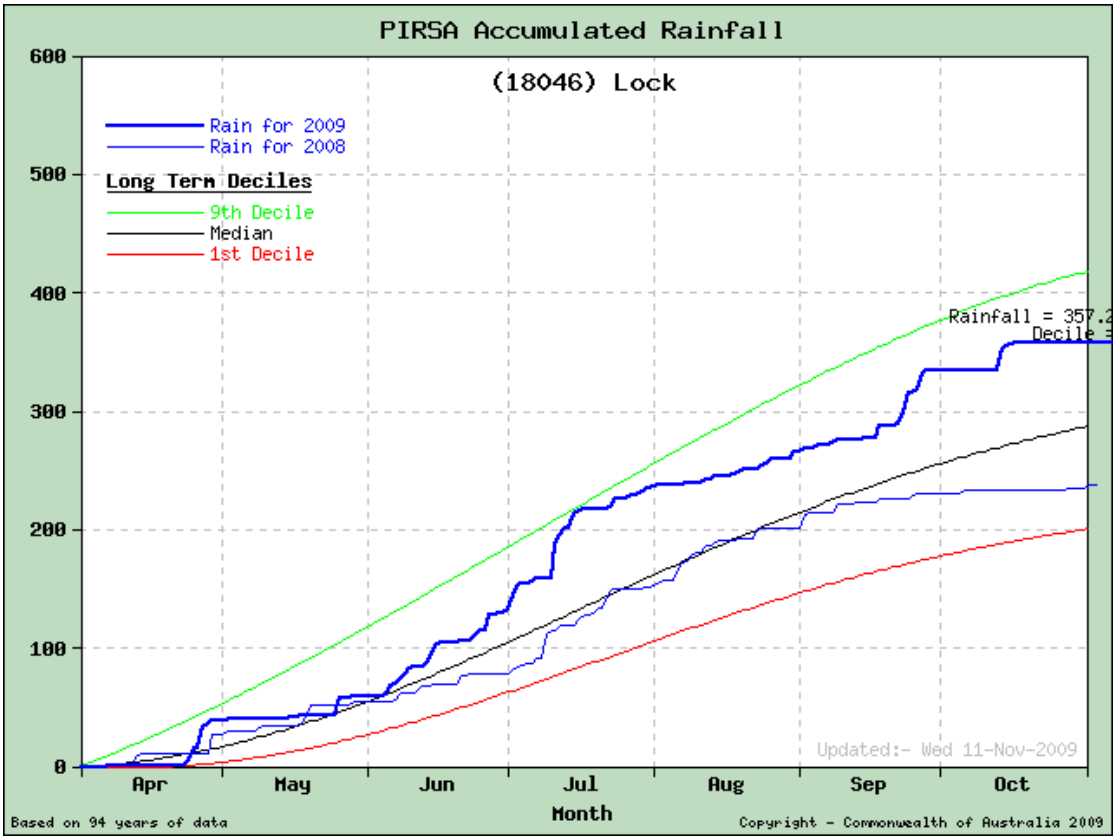
Appendix 1

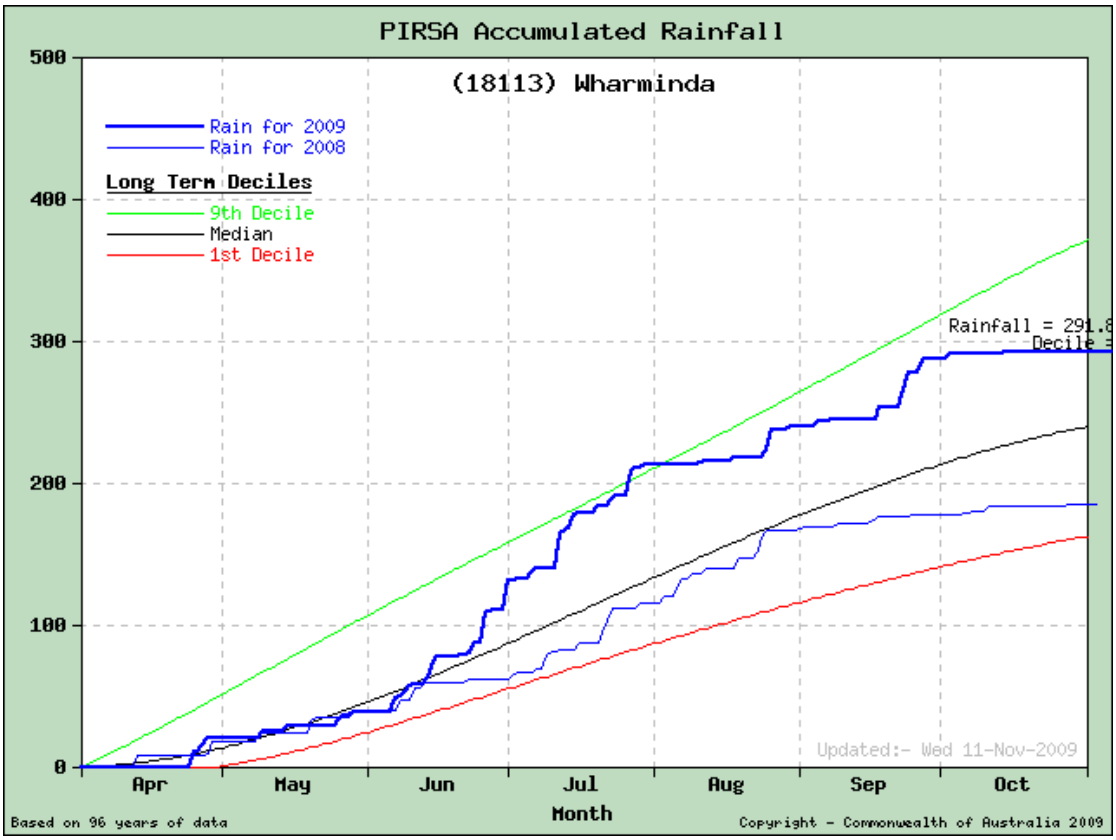
Cumulative rainfall data for selected sites across the Eyre Peninsula Region






PIRSA Accumulated Rainfall
(18195) Minnipa DPI
Rain for 2009
Rain for 2008
Long Term Deciles
9th Decile
Median
1st Decile
Rainfall = 286.6
Decile =
Updated:- Wed 11-Nov-2009
500
400
300
200
100
0
Apr
May
Jun
Jul
Aug
Sep
Oct
Month
Based on 94 years of data
Copyright - Commonwealth of Australia 2009


PIRSA Accumulated Rainfall
(18046) Lock
Rain for 2009
Rain for 2008
Long Term Deciles
9th Decile
Median
1st Decile
Rainfall = 357.2
Decile =
Updated:- Wed 11-Nov-2009
600
500
400
300
200
100
0
Apr
May
Jun
Jul
Aug
Sep
Oct
Month
Based on 94 years of data
Copyright - Commonwealth of Australia 2009


PIRSA Accumulated Rainfall
(18113) Wharminda
Rain for 2009
Rain for 2008
Long Term Deciles
9th Decile
Median
1st Decile
Rainfall = 291.8
Decile =
Updated:- Wed 11-Nov-2009
500
400
300
200
100
0
Apr
May
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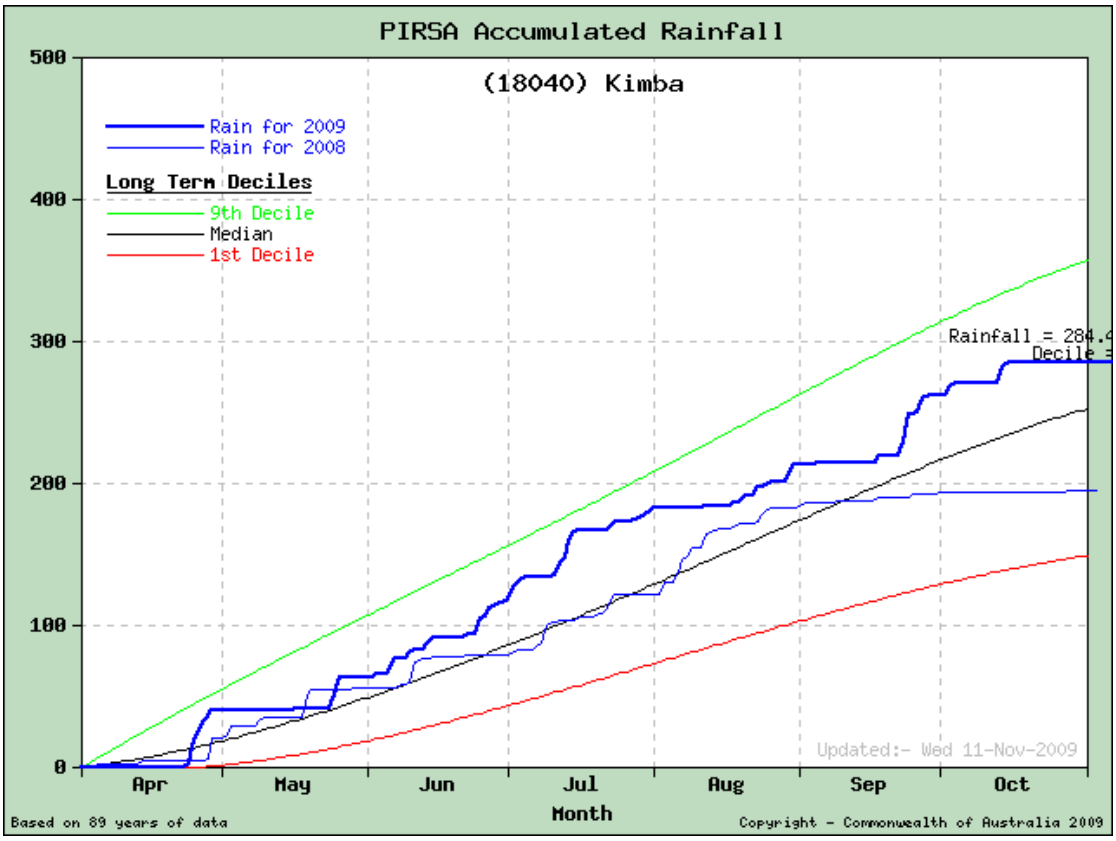
Sep
Oct
Month
Based on 96 years of data
Copyright - Commonwealth of Australia 2009


PIRSA Accumulated Rainfall
(18040) Kimba
Rain for 2009
Rain for 2008
Long Term Deciles
9th Decile
Median
1st Decile
Rainfall = 284.4
Decile =
Updated:- Wed 11-Nov-2009
500
400
300
200
100
0
Apr
May
Jun
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Aug
Sep
Oct
Month
Based on 89 years of data
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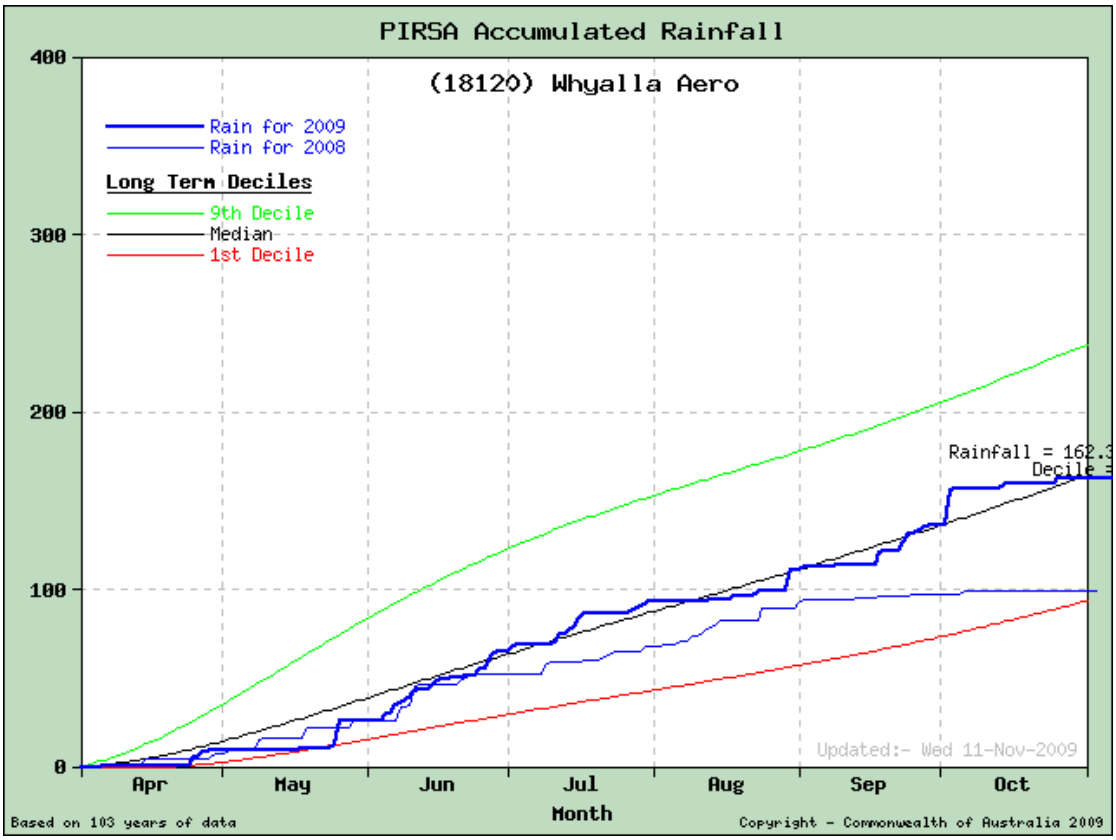
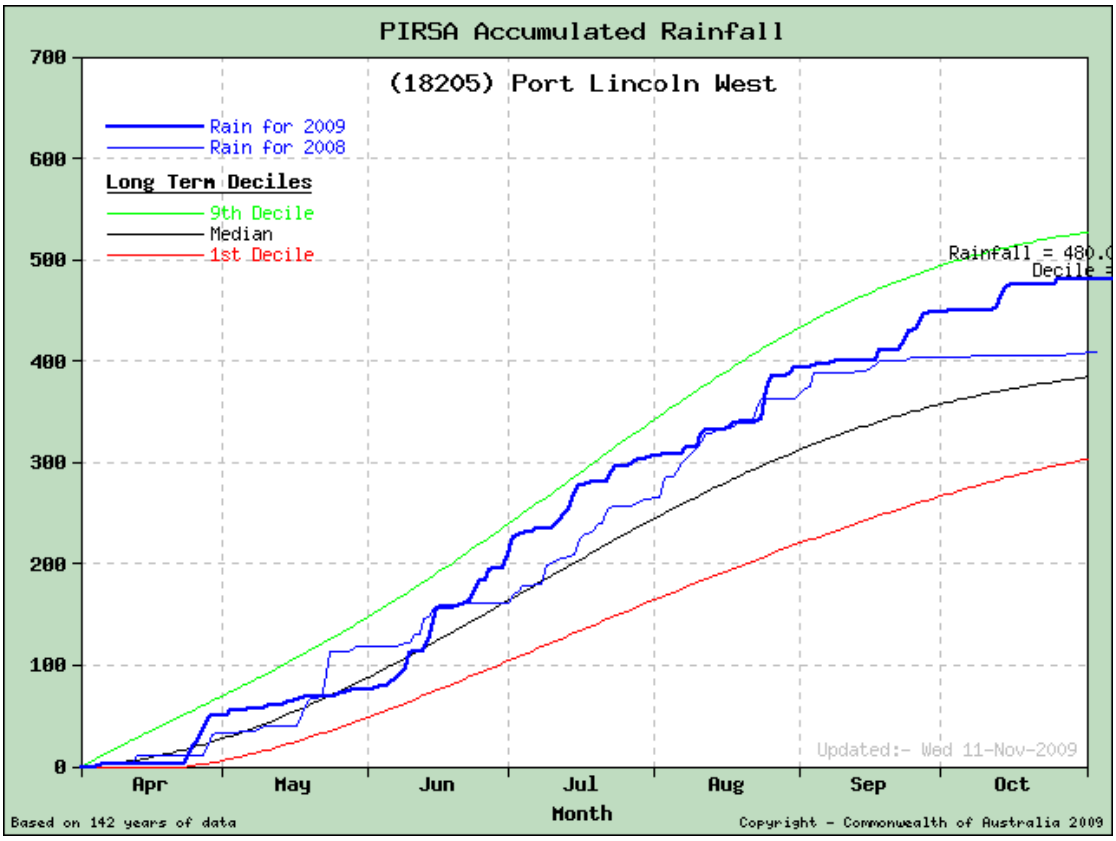

PIRSA Accumulated Rainfall
(18120) Whyalla Aero
Rain for 2009
Rain for 2008
Long Term Deciles
9th Decile
Median
1st Decile
Rainfall = 162.3
Decile =
Updated:- Wed 11-Nov-2009
400
300
200
100
0
Apr
May
Jun
Jul
Aug
Sep
Oct
Month
Based on 103 years of data
Copyright - Commonwealth of Australia 2009


PIRSA Accumulated Rainfall
(18205) Port Lincoln West
Rain for 2009
Rain for 2008
Long Term Deciles
9th Decile
Median
1st Decile
Rainfall = 480.0
Decile =
Updated:- Wed 11-Nov-2009
700
600
500
400
300
200
100
0
Apr
May
Jun
Jul
Aug
Sep
Oct
Month
Based on 142 years of data
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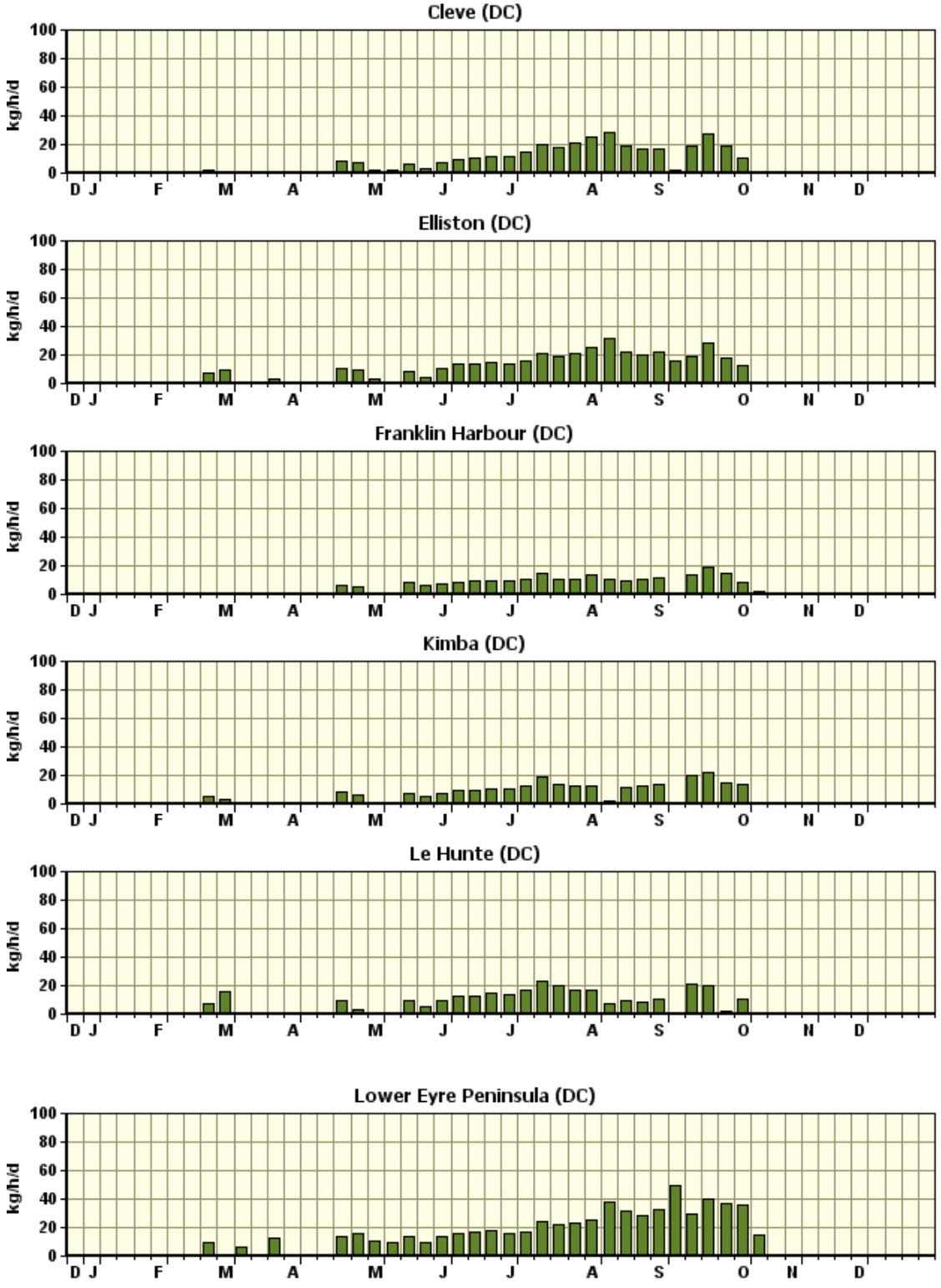
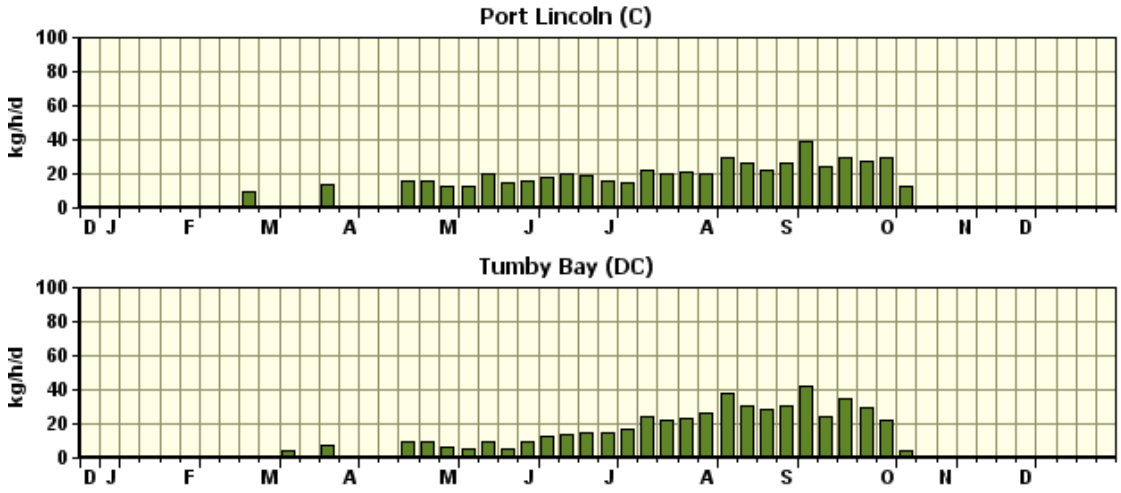
Appendix 2

Estimated Pasture Growth Rates (kg/ha/day) during growing season for some district council areas on Eyre Peninsula (note - data for areas on western EP not available) CSIRO Pastures from Space Program (www.pasturesfromspace.csiro.au)




Port Lincoln (C)
kg/h/d
100
80
60
40
20
0
D J F M A M J J A S O N D
Tumby Bay (DC)
kg/h/d
100
80
60
40
20
0
D J F M A M J J A S O N D